

App. No. : 09/804,458
Filed : March 12, 2001

REMARKS

Claims 1, 19, and 23 have been amended to include the limitations of cells comprising one or more membrane ion channels and a potential difference applied to electrodes to provide a non-rotating electric field that has a strength high enough to modulate the cells' transmembrane potentials but not high enough to cause electroporabilization of the cells' membranes. Support for the claimed strength of the electric field may be found in the specification, for example, at page 20, lines 4-12; page 33, lines 13-24; and page 41, lines 15-29. Support for the non-rotating character of the electric field may be found in the specification, for example, at page 36, line 12 to page 38, line 31, where an electric field is described that passes approximately linearly through a cell, passing into the cell membrane on the side of the cathode and exiting the cell membrane on the side of the anode. Claim 39 has been amended to correct the misspelling of the word "positioned." Claims 14-16 have been cancelled without prejudice to pursuing the claims in a continuation application. Claims 1, 3, 6-8, 10-13, and 19-41 remain pending in the application. Applicants have carefully considered all of the Examiner's rejections but respectfully assert that the pending claims are allowable over the Examiner's rejections for at least the reasons set forth below.

Rejections under § 112

The Examiner rejected Claims 14-16 under 35 U.S.C. § 112, ¶ 1 for failing to comply with the enablement requirement. For the purposes of advancing prosecution, the Applicants have cancelled Claims 14-16, thereby obviating the rejection. By canceling these claims, the Applicants in no way signify that they agree with the Examiner's rejections and note that such canceling does not affect the full scope of Claim 1.

Rejections under § 102 and § 103

The Examiner rejected Claims 1, 3, 6-8, 10-16, and 19-41 under 35 U.S.C. § 102 and/or 35 U.S.C. § 103 as being anticipated and/or obvious. In making these rejections, the Examiner cited as prior art U.S. Patent Nos. 5,128,257 (Baer et al.); 4,801,543 (Arnold et al.); 4,699,881 (Matschuke); 4,695,547 (Hilliard et al.); 6,352,853 (King et al.); and 5,422,272 (Papp et al.). The Applicants respectfully submit that Claims 1, 3, 6-8, 10-13, and 19-41 are patentable over the cited prior art. Specifically, with respect to Claims 1, 3, 6-8, and 10-13, none of the prior art disclose or suggest a potential difference applied to electrodes to provide a non-rotating electric

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field that varies by less than about 10% from a mean field intensity over at least about 20% of the surface area of the bottom surface of a sample well and a plurality of cells placed within at least one sample well, the cells comprising one or more membrane ion channels, wherein the electric field has a strength high enough to modulate the cells' transmembrane potentials but not high enough to cause electroporabilization of the cells' membranes. With respect to Claims 19-41, none of the prior art disclose a plurality of cells placed within a sample well, the cells comprising one or more membrane ion channels, wherein a potential difference is applied to electrodes to provide a non-rotating electric field that has a strength high enough to modulate the cells' transmembrane potentials but not high enough to cause electroporabilization of the cells' membranes.

Baer et al. discloses an "electroporation process" and "electroporation apparatus" where "the overall applied voltage" is such "to produce the necessary voltage/cm required to achieve transfection." See Baer et al, column 2, line 51 to column 3, line 15 and column 6, lines 59-60. Arnold et al. discloses using "rotating electrical field forces with opposite directions of rotation" to differentiate particles, such as cells based on their induced rotational behavior. See Arnold et al., column 2, lines 35-42. Matschuke discloses "treatment of cells in an electric field, particularly for the fusion of cells." See Matschuke, column 1, lines 45-47. An "electrical rupturing pulsation" is used to disrupt "the membrane structure between adjacent cells" so as to produce holes "in the areas of contact of the membranes of adjacent cells." See Matschuke, column 1, line 60 to column 2, line 1. Hilliard et al. discloses a probe that can be used to introduce "foreign macromolecules (nucleic acids and proteins) into target cells" using a "suitable source of high voltage pulses." See Matschuke, column 1, lines 19-21 and column 4, lines 32-43. King et al. discloses an "electroporation apparatus." See King et al., column 1, lines 41-43; column 3, lines 2-4; column 4, lines 21-27; and column 5, line 32 to column 6, line 19. Papp et al. discloses a method and apparatus "for transiently forming holes in dielectrics, such as cell membranes, by the application of a controlled electric field (electroporation)." See Papp et al., column 2, lines 25-29; column 3, line 31; and column 6, lines 17-22. Accordingly, none of these prior art anticipate and/or render obvious any of the pending claims. Therefore, the Applicants respectfully submit that the pending claims are allowable and request that a Notice of Allowance be timely issued.


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Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

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